



FORRESTER®

The Total Economic Impact™ Of Arria Natural Language Generation

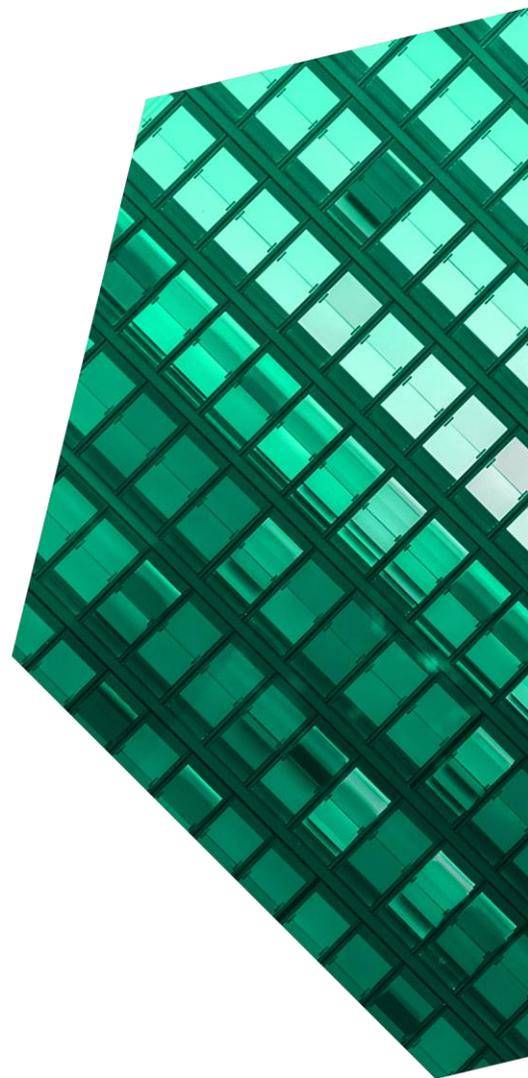
Cost Savings And Business Benefits
Enabled By Arria Natural Language Generation

JANUARY 2022

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ABOUT FORRESTER CONSULTING

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Executive Summary

In today's ever-shifting global economic landscape, it is increasingly important for businesses to prioritize agility and foster internal innovation to stay competitive and get ahead. Arria's natural language generation technology analyzes data and generates narrative insight summaries, which help organizations automate reporting and communicate business insights to decision-makers across their organizations, enabling innovation across business models, processes, and customer experiences.

Most of today's fastest-growing firms use technology as an innovation driver to significantly outgrow their competitors. The use of technology to automate manual work and instill continuous insights-to-action processes can fuel this innovation. [Arria natural language generation \(NLG\) technology](#) helps businesses automate report generation and data analytics and communicate dynamic insights to humans, creating insight narratives that are easily understood by decision-makers across organizations. NLG allows organizations to eliminate manual processes, scale efficiently, speed decision-making, democratize data understanding, and empower unified planning and decision-making efforts. With these benefits, Arria breaks down innovation barriers and helps propel organizations on the path towards innovation.

Innovation leaders that focus on technology-fueled change and prioritize more difficult types of innovation, like changes to their business models and employee and partner experiences, grow at 3.6 times their industry average.¹ However, innovation blockers such as time and resource constraints, highly manual processes, slow decision-making, and disjointed planning can make this type of disruptive innovation feel impossible. Embracing and prioritizing process automation and continuous, real-time business insight generation and distribution can help organizations solve for these challenges.

KEY STATISTICS



Return on investment (ROI)
209%



Net present value (NPV)
\$3.06M

Forrester predicts that in 2022, a significant number of organizations will turn to automation to develop innovation culture, create business models, take new products and services to market, and rethink their customer experiences.² But automation alone isn't enough to allow innovation to flourish. Organizations must embrace real-time data analytics and business intelligence (BI) insight generation and distribution capabilities. Laying this groundwork ensures that when automation frees up employee's time, they have the proper knowledge and capabilities in place to differentiate their products and customer experiences, enable agility, and drive innovation.

Many organizations rely on traditional BI platforms to discover and communicate insights, but often find that charts and data alone can't tell the whole story. Enterprises have deployed BI platforms for more than three decades, but Forrester still sees only 20% to 30% of decision-makers frequently using BI applications. Instead, many rely on data or business

analysts for data-driven insights beyond simple descriptive and diagnostic analytics.³

It's clear that decision-makers need insight explanations that are both comprehensive and easily digestible, but those who turn to business analysts to write summaries or explanations for decision-makers are left with another set of challenges: professional data scientists are expensive and hard to find, lengthy written insight explanations and summaries are prone to mistakes or missing information, extensive production times cause delays when decisions need to be made quickly, and scaling insights generation and distribution efforts requires extremely costly or impossible headcount increases. The most forward-looking organizations are considering technology as a better way to serve up insights to decision-makers, and natural language generation (NLG) provides them with a solution.

Arria's NLG technology analyzes data and communicates insights to humans in a natural way, turning data into narratives, explanations, summaries, and conversational content that is indistinguishable from human writing at machine speed and scale.⁴ Arria's primary NLG use cases include report automation and the generation of BI narrative insight summaries and explanations. These uses of NLG allow organizations to eliminate manual processes, scale efficiently, accelerate decision-making, democratize data understanding, and empower unified planning and decision-making efforts.

Arria licenses its NLG technology suite directly to customers as part of its mission to humanize the way people and businesses interact with data. Along with NLG, Arria provides natural language understanding (NLU), natural language processing (NLP), machine learning, data visualization, cloud management, and new product development services to customers.

Arria commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Arria NLG.⁵ The purpose of

this study is to provide readers with a framework to evaluate the potential financial impact of Arria NLG on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed seven decision-makers with experience using Arria NLG. For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single [composite organization](#).

Prior to using Arria NLG, the interviewed decision-makers noted that their organizations engaged in highly manual work to create reports and uncover, write, and deliver insights from data and BI dashboards, which was extremely time consuming. They found it difficult and costly to scale their reporting and looked to automate steps in or the entirety of their report creation process. In addition, interviewees mentioned that data and insight visibility across their organizations was low, and that written insight summaries for decision-makers could be difficult to understand, not comprehensive across all relevant layers of data, or siloed across the organization.

The interviewees' organizations invested in Arria NLG to reduce manual work, enable machine-level scaling, and facilitate the distribution of more efficient, accurate, and connected insights across their organizations. Key results from the investment include an 80% reduction in manual report generation labor, 30%-to-60% time savings for BI analysts and their supported decision-makers, the elimination of human error in reporting and written insight narratives, and an increase in annual revenue of up to 2%.

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits include:

- **Increased business growth by up to 2%.** Arria NLG enabled business growth for the areas of the business supported by NLG in a variety of ways. Arria NLG improved both customer acquisition and retention, enabled a higher volume of business, and improved the speed and quality of decision-making for organizations. Over three years, the risk-adjusted profit from this business growth has a present value of nearly \$1.7 million.
- **Automation of 80% of manual reporting.** Arria NLG enabled the interviewed decision-makers' organizations to streamline reporting processes, automate data analysis and narrative creation, and empower employees to spend more time on knowledge work. Over three years, the savings from report automation are worth more than \$1.1 million.

to their areas of interest and easier to consume than lengthy explanations of BI insights. Over three years, savings from BI narrative creation are worth more than \$1.6 million.

- **Decreased errors and rework.** Manual processes and human-generated narratives are susceptible to data and quality errors, which can lead to huge amounts of rework and mitigation. NLG narratives remove the risk of human error, saving organizations time and putting their minds at ease. Over three years, the labor savings from decreased errors and rework are worth more than \$100,000 to the organizations.

Unquantified benefits. Benefits that were realized by interviewees' organizations but were not quantified for this study include:

- **Avoided hiring costs and expert labor costs, especially when scaling work.** Organizations could shift work from more skilled professionals to employees with less training and avoid the costs of additional headcount when scaling up reporting or insight narrative production.
- **Improved employee experience.** Arria NLG improved the employee experience at the interviewee's organizations by freeing employees from repetitive and highly manual work and through the cool factor of NLG technology.
- **A forward-thinking, innovative brand culture and brand image.** New standards of insight quality and consistency encouraged trust in decentralized decision-making, and implementation of NLG in one area of the business increased exposure to the technology across other areas of the business and led to faster adoption of new technologies across wider business units.
- **Excellent customer service with access to NLG expertise.** Arria is the professional home to

Incremental profit from business growth:

\$1,670,17

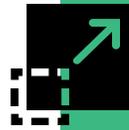


- **BI narrative efficiency.** Arria's BI narratives provide both automation and data literacy benefits to customers. BI analysts are freed from the need to uncover and describe insights manually. Insight narratives integrated with a dashboard are comprehensive and centrally managed, replicating business knowledge across the organization. Decision-makers also save time with direct access to self-serve, instantly generated narratives that are specifically tailored

the largest concentration of NLG expertise in the world, and interviewees frequently praised the help and guidance Arria provided their organizations during the implementation process.

Costs. Risk-adjusted PV costs include:

- **Arria licensing costs totaling just under \$175,000 over three years.** Arria licenses its products on a subscription model, with varying pricing options depending on its customers' use cases.
- **Cloud hosting costs totaling \$217,000 over three years.** The composite organization pays Arria an annual fee for cloud hosting, as they chose to deploy Arria Studio, Arria's platform for building custom NLG applications, with a private cloud hosted by Arria.
- **Implementation and maintenance costs totaling about \$1 million over the first three years of use.** Implementation efforts included planning, coordinating among cross-organizational teams such as cloud or security teams, and integrating the platform with other tools, totaling to about \$385,000 in implementation labor costs. Arria's NLG narratives require almost no maintenance once fully set up, but the composite organization spends time optimizing and expanding Arria's reach within the organization throughout the first three years of deployment. To oversee Arria and roll out NLG to more users and additional process automation, the organization pays about \$250,000 per year in labor costs.
- **Training labor costs of about \$46,000.** Organizations faced labor costs associated with the time employees spend receiving training on Arria NLG. Training efforts were larger for developers and lighter for users working to automate narrative creation. Decision-makers who utilized BI narratives did not require training.



Arria licensing cost:

\$174,713

The decision-maker interviews and financial analysis found that the composite organization experiences benefits of \$4.53 million over three years versus costs of \$1.47 million, adding up to a net present value (NPV) of \$3.06 million and an ROI of 209%.



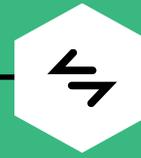
ROI
209%



BENEFITS PV
\$4.53M

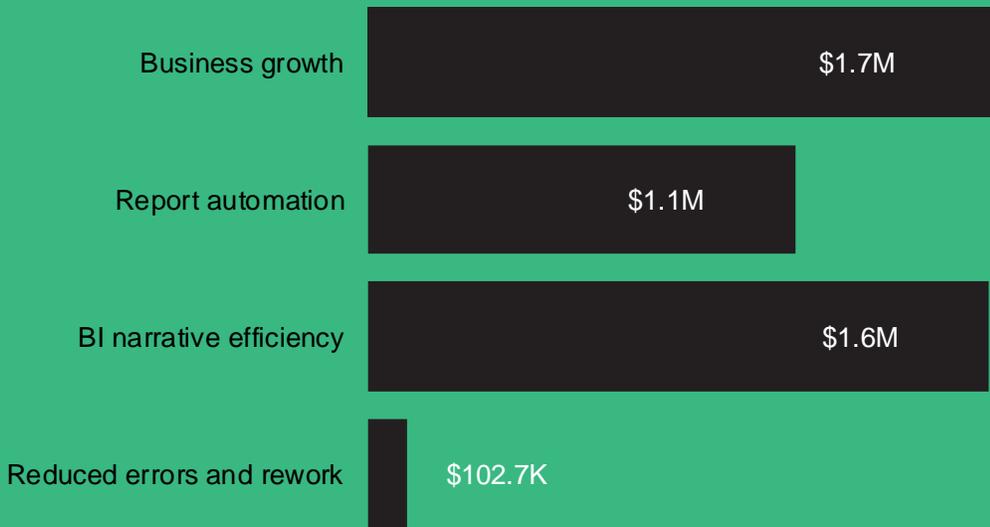


NPV
\$3.06M



PAYBACK
8 months

Benefits (Three-Year)



[Arria NLG has] allowed me to step back and lead more, and it's given us the ability to remove ourselves from the minutiae of the data.

— Vice president, restaurant

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in Arria NLG.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Arria NLG can have on an organization.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Arria and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates with in the framework provided in the study to determine the appropriateness of an investment in Arria NLG.

Arria reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

Arria provided the customer names for the interviews but did not participate in the interviews.



DUE DILIGENCE

Interviewed Arria stakeholders and Forrester analysts to gather data relative to Arria NLG.



DECISION-MAKER INTERVIEWS

Interviewed seven decision-makers at organizations using Arria NLG to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewees' organizations.



FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the decision-makers.



CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

The Arria NLG Customer Journey

Drivers leading to the Arria NLG investment

Interviewed Decision-Makers				
Interviewee	Industry	Region	Primary Business Unit Using Arria NLG	Primary NLG Use Case
Managing director	Financial services	North American headquarters, global operations	Data and analytics	Report automation
Executive director	Financial services	EMEA headquarters, global operations	Alternative data	Report automation
Senior manager	Professional services	North American headquarters, global operations	Consulting	BI narratives
Senior manager	Professional services	EMEA headquarters, global operations	Consulting strategy	Report automation
Principal IT project manager	Pharmaceutical	EMEA headquarters, global operations	Global business services	BI narratives
Director	Pharmaceutical	North American headquarters, global operations	Finance and digital team	BI narratives
Vice president	Restaurant (quick serve)	North American headquarters, global operations	Franchised restaurants	BI narratives

KEY CHALLENGES

Forrester interviewed seven decision-makers from organizations with experience using Arria NLG. Before investing in Arria, the organizations manually created internal and external reports on a regular basis. Internal reporting included business updates for decision-makers or data analysis and summaries for research groups, while external reporting consisted of client- or customer-facing deliverables or compliance reporting. Report creation was typically conducted by a team of analysts who spent most of their time analyzing data and turning it into reports through spreadsheets, slide decks, or written documents.

Interviewed decision-makers said that their organizations conducted BI insights generation and communication with a similarly manual process. Most organizations had one or more existing BI platforms in place but did not have one unified solution serving all areas of the business, and still relied on employees to uncover insights and communicate

their findings to decision-makers with presentations or insight narratives. The organizations struggled with common challenges or problems that drove their need for a new solution, including:

- Manual and time-consuming reporting.** The interviewees' organization's existing reporting processes were cumbersome, sometimes requiring coordination between many different review steps or the analysis of differentiated data located in multiple areas. A senior manager at a professional services organization described their previous process the following way: "These are labor-intensive reports that get written for pretty much every transaction. We have to generate pretty accurate reports off of tons and tons of spreadsheets, and typically that was done manually. We take a lot of client data, we manage the data, we clean the data and then we write [reports that run] somewhere between 20 and 100 pages."

- **Insights generation that was slow and lacking in comprehension and cohesion.** Interviewees shared that while their organizations did often have an insights generation process in place, it was labor intensive, inefficient, and took too long to get insights to the right people. Data analysts would manually generate insights commentary for decision-makers, looking through sheets of data to identify trends and writing explanations on the underlying factors and numbers behind them. This individual work led to inconsistency in the insights delivered up the food chain and left room for trends to go unnoticed.

“We have to generate pretty accurate reports off the back of tons and tons of spreadsheets and typically that was done manually.”

Senior manager, professional services

- **Manual processes that were difficult to scale.** Interviewees recognized that their organizations’ reporting and narrative insight capabilities were often restricted by their employee counts, and this sometimes limited the number of clients they were able to serve. One decision-maker reported that as their organization grew, it struggled to comprehensively report on the performance of every part of the business as its headcount could not keep up with the volume of data it needed to derive insights from. However, hiring additional employees was costly and a relatively short-term solution. An executive director at a financial services company shared: “We analyze dozens of data points for thousands of companies. To be

able to write a narrative summary every month for each one, we’d have to hire an army. We wouldn’t be able to scale that.”

- **Insights that were hard to understand and distribute across the organization.** For many of the interviewee’s organizations, the output of historical insights generation processes was long and dense. A director at a pharmaceutical company expressed: “If you wanted to show [a decision-maker] what is happening, they would look at Excel sheets, which are floating around from analysis in emails or other systems. You had to really read to get a good glimpse on what is happening. We have [more than] 140 markets. Are you going to give me 140 pages to read? It’s insane.” Business units and decision-makers across the organization also sometimes used different BI platforms, and commentary generation, editing, and distribution were not centrally managed, making cohesive insights impossible. This lack of comprehensive insights meant that organizations felt an inability to innovate or respond quickly to customer desires.
- **Data quantity or complexity that was beyond employee capabilities to digest.** Interviewees spoke of data quantities and speed requirements that were not just difficult to scale with increased headcount, but impossible. A managing director at a financial services company explained, “Running that report from end to end, producing it and understanding this thing called fixed-income attribution in four seconds is frankly impossible [manually].”

“We had a couple of problems — silos on Excel, silos on the system, and silos on the commentary.”

Director, pharmaceutical

INVESTMENT OBJECTIVES

The interviewees' organizations searched for a solution that:

- **Was easy to use and easy to maintain.** The interviewed decision-makers looked for a solution that could be set up quickly and would easily integrate with their existing systems. They prioritized looking for a tool that could be updated, used, and managed by non-technical employees without programming experience. As one interviewee acknowledged, "Kudos to the Arria team that you don't need to be a software developer."
- **Was heavily customizable.** Organizations did not want to be limited in the ways they could use and customize an NLG solution and wanted to feel in control of the tools they were using. Nearly all of the interviewee's organizations took advantage of Arria's "NLG your way" mentality. Not only did organizations utilize high levels of customization to create their own specifications within standard use cases, but they also worked with Arria to develop their own use cases and even new products. A principal IT project manager at a pharmaceutical company explained, "We wanted to build the capability ourselves and build up the team and not be relying on consultants, and we wanted to build the skills to maintain it over time."
- **Had flexible deployment options.** Arria allows for deployment on-premises or in a publicly or privately managed cloud environment, a choice that was part of the deciding factor in some organization's investment decisions. Some interviewees chose on-premises implementation for extra control or to avoid more rigorous testing and confidentiality protocols. Others wanted the ease of maintenance and security that Arria provided with their privately hosted cloud.
- **Enabled scale without sacrificing quality or incurring high labor costs.** The interviewed

decision-makers looked to scale existing processes while avoiding cost or staff increases and without sacrificing any quality. Some had the specific goal to decrease costs through automation and avoided labor costs.

- **Supported capacity release.** Interviewees aimed to release their employees from manual processes to allow them to focus on higher-value work.
- **Ensured accuracy and consistency in reporting and insights.** Faced with inconsistent reporting or insights commentary, interviewees looked for a solution that could centrally manage the processes and increase consistency in different areas of the business. A director at a pharmaceutical company stated, "One goal was increased consistency of reporting — we are in a hundred countries, doing things a hundred different ways."
- **Moved the organization towards a tech-oriented way of working and a more innovative and tech-forward brand image.** Organizations looked for a new solution as part of an innovation strategy to help bring their employees further into the digital world and take advantage of newer technologies. Often, they aimed to cultivate a more automated and insights-driven culture within the organization and push the organization's brand image as an innovator.

After evaluating multiple vendors, the interviewees' organizations chose Arria NLG and ran a proof of concept (POC). Every interviewed decision-makers' organization chose to begin deploying Arria NLG within one section of the business, with plans to expand both within the business unit and ultimately throughout the organization over time. NLG was often deployed primarily for either report automation or BI insight narrative generation, but a number of the organizations utilized Arria NLG for both use cases or had plans to do so in the future.

COMPOSITE ORGANIZATION

Forrester created a composite organization to be representative of the seven decision-makers' organizations that had experience with Arria NLG. Forrester then applied the TEI framework and constructed an ROI analysis for the composite organization, which is representative of the financial impact of Arria NLG and is presented as the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. The composite organization is a large B2B services enterprise with 20,000 global employees and \$5 billion in annual revenue. The organization provides regular reports for internal and external clients, ranging from client-facing financial reporting to internal research and insight summaries and explanations. The organization uses a BI platform to supply decision-makers across the organization with BI dashboards that are supplemented with narrative commentary by Arria.

Deployment characteristics. The composite organization initially deployed Arria for automated reporting and the generation of dashboard narratives in one analytics-heavy business unit that supports other areas of the organization. The organization chose to deploy Arria with a private cloud hosted by Arria. Arria's backend API connects to the existing BI platform used by the composite organization and to other data sources used for the narrative generation.

The business unit utilizing NLG has 100 employees but supports another 500 decision-makers and \$750 million in annual revenue across the organization. The organization expands their deployment of Arria throughout the three modeled years, starting with deployment to three-fifths of the business unit's employees and equivalent work in Year 1. In Year 2, Arria's reporting and BI narratives support four-fifths of the business unit, reaching 100% in Year 3.

Key assumptions

- **Total revenue: \$5 billion**
- **Business unit employees: 100**
- **Supported revenue: \$750 million**
- **Supported employees: 500**
- **Profit margin: 10%**

Analysis Of Benefits

■ Quantified benefit data as applied to the composite

Total Benefits						
Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	Business growth	\$300,000	\$600,000	\$1,200,000	\$2,100,000	\$1,670,173
Btr	Report automation	\$233,280	\$466,560	\$699,840	\$1,399,680	\$1,123,460
Ctr	BI narrative efficiency	\$500,580	\$667,440	\$834,300	\$2,002,320	\$1,633,498
Dtr	Reduced errors and rework	\$29,160	\$42,120	\$55,080	\$126,360	\$102,701
	Total benefits (risk-adjusted)	\$1,063,020	\$1,776,120	\$2,789,220	\$5,628,360	\$4,529,832

BUSINESS GROWTH

Evidence and data. Arria NLG enabled business growth for the interviewee's organizations in a variety of ways depending mainly on their use case. For each organization, Arria improved customer acquisition and retention, enabled a higher volume of business, or improved decision-making within the organization. Specific examples of customers' journeys from NLG to revenue growth included:

- **Improved customer acquisition.** Some organizations achieved new business through the creation of a new type of product or service for external customers. As an executive director at a financial services organization noted, "We've created a series of new reports that we wouldn't have even tackled before." Others were able to deliver their reporting and insights services faster or at a higher volume, improving their quality of services provided and generating additional revenue. A senior manager at a professional services organization described the impact of Arria with: "Clients are coming to us and saying, 'We're interested too, what can you tell us about it?' So, it made us more credible in certain areas in the marketplace. It definitely opened a lot of

conversations with clients that we wouldn't have been able to have previously."

"We're opening more doors and starting to win more clients because of this additional capability."

Managing director, financial services

- **Increased client retention through a better customer experience.** In addition to customer acquisition, the ability to provide services faster or at a higher volume also contributed to an improved customer experience that helped retain existing clients. One interviewee noted: "When client contracts come up for renewal, we're offering them this extra service as a keep them sweet type deal. We're saying, 'We're giving you this capability which you can't possibly have imagined.'" The reduction of manual processes

also contributed to better customer service. As a senior manager at a professional services organization described: “This stuff takes so long to do manually and if you can automate it, you can have better conversations with the clients. You can give the client a much better experience because you're not kind of just going through the manual grunt work time and time again.”

- Scaled reporting and capacity release to serve more customers.** Decision-makers spoke of capacity release and faster processes that enabled employees to spend more time on higher-value activities and increasing their capabilities to take on more work. A senior manager at a professional services organization told Forrester: “Unlike software, we can sell out if we don't have enough people. [Arria] allows us to take on more jobs.” Others credited their ability to serve more customers to the scale of production that Arria enabled. An executive director at a financial services company shared that, “Using Arria, we're able to scale to a level that we couldn't scale manually at all.”
- Faster and more informed business decision-making.** Organizations utilizing Arria for BI narratives spoke of decreased time-to-insights for business leaders and improved cohesion between decision-makers across the organization. Arria's ability to analyze data across multiple BI platforms and centrally manage insights enabled transparency and consistency between leaders of different areas of the business. One interviewee in the quick-serve restaurant industry named 3% to 5% topline growth attributable to Arria through better and faster managerial decision-making, improved access to insights, increased throughput, and higher order conversion rates. While some of this growth is attributed to the efficiency and insights from NLG, this interviewee was also utilizing Arria's services beyond those of the composite organization.

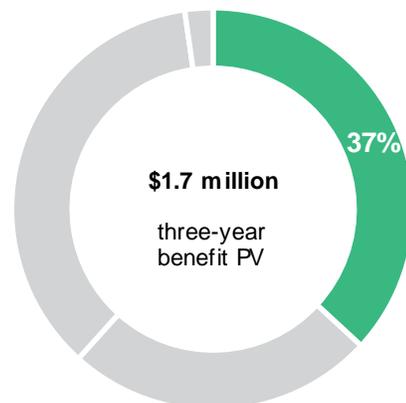
Modeling and assumptions. For the composite organization, Forrester assumes the following:

- The analytics-heavy business unit supports \$750 million in annual revenue across the rest of the organization.
- In Year 1, the organization achieves a 0.5% lift in annual revenue due to Arria NLG, which increases to 1% in Year 2, and 2% in Year 3.
- The organization has an operating profit margin of 10%.

Risks. The expected financial impact of business growth due to Arria is subject to risks and variation based on several factors, including:

- The scope and specifics of an organization's use case with NLG.
- An organization's annual revenue and operating profit margin.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of over \$1,670,000.



Business Growth					
Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Baseline annual revenue	Composite	\$750,000,000	\$750,000,000	\$750,000,000
A2	Increase in revenue with Arria	Interview	0.5%	1.0%	2.0%
A3	Operating profit margin	TEI standard	10%	10%	10%
At	Business growth	A1*A2*A3	\$375,000	\$750,000	\$1,500,000
	Risk adjustment	↓20%			
Atr	Business growth (risk-adjusted)		\$300,000	\$600,000	\$1,200,000
Three-year total: \$2,100,000			Three-year present value: \$1,670,173		

REPORT AUTOMATION

Evidence and data. Arria NLG helped the interviewed organizations streamline reporting processes or replace manual report creation entirely. This allowed employees to spend time on higher-value work by automating work that was previously done manually. The type of reporting and level of automation varied between organizations.

- Some types of automated reporting across the interviewee’s organizations included:
 - Transaction compliance reporting.
 - Internal and external research support through data analysis reports.
 - Client-facing financial reporting.
 - Insight reporting for internal decision-makers.
- The scope of reporting that utilized Arria NLG ranged from just a few hundred reports per year to 15,000 per month.
- Some interviewee’s organizations used templates for report creation, while others created custom applications for specific types of reports and narratives. Often, organizations used a mixture of

the two, taking advantage of Arria’s templates for lower complexity use cases and undertaking custom design for more complex work.

- Some of this reporting was automated end-to-end and required no human involvement, even removing human oversight. The executive director at a financial services organization described: “The process is automated end to end. Once it’s been in production, it just runs automatically.” Other instances were more interactive, where an analyst may feed in and change thresholds or key parameters for unique reports.
- Interviewees found that their organizations saved review and QA time with Arria’s narratives as well. An executive director at a financial services

“Using the software to generate a report saves about 20 hours per use.”
Senior manager, professional services

organization stated: “[With Arria] we knew that we wouldn’t have any language that wasn’t approved. If they were manually written, somebody would review them.”

Modeling and assumptions. For the composite organization, Forrester assumes the following:

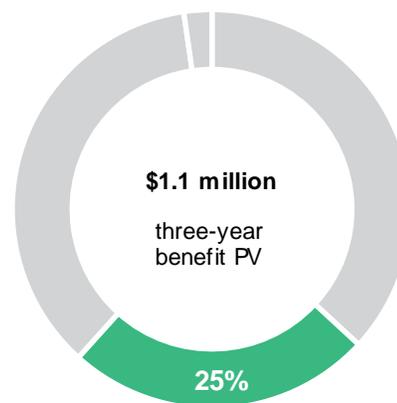
- Arria NLG automated the creation of 1,200 previously manual reports in Year 1, 2,400 in Year 2, and 3,600 reports in Year 3.
- Each report took 12 hours on average to create manually.
- Arria NLG saved the organization’s analysts 80% of the time they previously spent creating reports.
- The organization’s analysts have a fully burdened hourly salary of \$45.
- Each FTE recaptures 50% of their saved time into productivity value.

Risks. The expected financial impact of report automation is subject to risks and variation based on several factors, including:

- The scale and complexity of reporting replaced with NLG.

- The level of review and human touch required for the reporting replaced with NLG.
- Compensation amounts for employees and recapture rates of productivity on saved time.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of over \$1,123,000.



Report Automation					
Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Annual number of manual reports automated with Arria	Composite	1,200	2,400	3,600
B2	Hours spent per report before Arria	Interview	12	12	12
B3	Percentage of report labor saved by automation	Interview	80%	80%	80%
B4	Analyst fully burdened hourly salary	TEI standard	\$45	\$45	\$45
B5	Percentage of time recaptured	Forrester	50%	50%	50%
Bt	Report automation	B1*B2*B3*B4*B5	\$259,200	\$518,400	\$777,600
	Risk adjustment	↓10%			
Btr	Report automation (risk-adjusted)		\$233,280	\$466,560	\$699,840
Three-year total: \$1,399,680			Three-year present value: \$1,123,460		

BI NARRATIVE EFFICIENCY

Evidence and data. Arria's NLG solution identifies key insights and provides configurable, out-of-the-box narratives to communicate those insights to decision-makers in real time, providing both automation and data literacy benefits for customers. Some organizations were already using a BI platform but were manually writing narratives to accompany dashboards to explain charts and dig into reasons behind higher-level data changes. Others had BI analysts or controllers who delivered information to decision-makers in the form of slide decks or written commentary without the use of a BI dashboard. In these cases, the organizations invested in a typical BI platform alongside Arria, as Arria can deploy with all major BI platforms. Nearly all the interviewed decision-makers said their organizations began utilizing Arria within one region or section of the business and has expanded the capability within the organization over time.

- By generating instantaneous narratives to accompany dashboard views at the click of a button, Arria removed a large portion of the manual work previously undertaken by BI analysts, though these analysts could still choose to add color or additional detail to generated narratives. Estimates of the reduction of manual commentary work due to Arria ranged from 50% to 85%. A vice president in the restaurant industry explained, "It's like putting an analyst on your team without spending the hundred thousand dollars for a college background."
- Organizations found Arria's BI narratives most helpful when utilized across multiple levels of data, where the narrative could provide the view beneath what's being shown in a single dashboard view. The narratives can explain underlying movements, removing the need to review all available data manually and then write insight summaries based on the layers of data.

- Not only does Arria save time for BI analysts, it also had multiple benefits for decision-makers who rely on the insights. Interviewees communicated a new ability for fellow decision-makers in their organizations to avoid the constant need to ask BI analysts for information, as they were instead able to self-serve the information they needed in an easily digestible, but still comprehensive, format. A senior manager at a professional services organization said, "Feedback from leadership was that [Arria] is really valuable because they don't need to ask somebody all the time [for reports], and they get all the important information really conveniently presented there already."



Reduction in labor for in manual insights generation:

60%

- An interviewed principal IT project manager noted that the quality of the automated narratives were an improvement over previous insights narratives as well, saying, "The commentary itself is more consumable."
- Finally, Arria's integration with all major BI platforms allowed decision-makers across the entirety of an organization to see the same narratives instantaneously, putting them all on the same page about where problems were and what to do next. At the same time, they were able to tailor the narratives they received to their specific areas of interest. A director at a pharmaceutical organization shared: "The commentary generation is centrally managed, the

commentary editing is centrally managed, and commentary distribution is centrally managed. Your life becomes easy because you could get specific focus and commentary for you, where before, you had to go through 10 different documents in 10 different places.”

“Eighty-five percent of manual work has been eradicated now because of how rich this commentary is.”
Director, pharmaceuticals

Modeling and assumptions. For the composite organization, Forrester assumes the following:

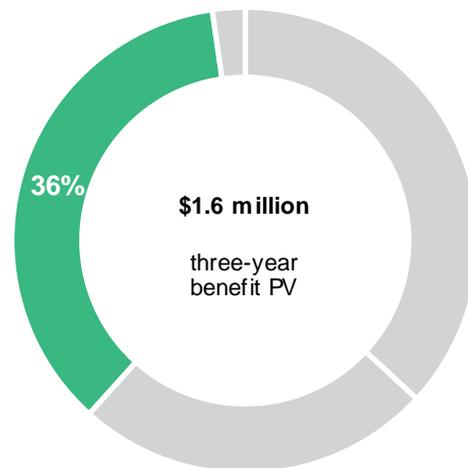
- The organization rolls out Arria’s BI narratives for three-fifths of the BI analysts in Year 1, increasing to four-fifths in Year 2 and reaching all of the business unit’s BI analysts in Year 3.
- BI analysts spent 25% of their time on manual insights generation and presentation before Arria and achieved a 60% reduction in this time with Arria.
- The fully burdened rate of a BI analyst is \$45 per hour, and the fully burdened cost of a decision-maker is \$80 per hour.
- The number of decision-makers supported by Arria’s BI narratives increases with the number of analysts using Arria, from 300 in Year 1, to 400 in Year 2, and 500 in Year 3.
- Decision-makers spent an average of 8 hours on analysis during each of the 12 annual reporting periods before Arria.
- Decision-makers experience a 30% reduction in their time spent digesting insights with Arria.

- Each FTE recaptures 50% of their saved time into productivity value.

Risks. The expected financial impact of BI narrative efficiency is subject to risks and variation based on several factors, including:

- The complexity and scope of manual BI narration replaced with Arria.
- The size of the team or amount of labor spent on manual insight generation for analysts and insights digestion for decision-makers before Arria.
- Compensation amounts for employees and recapture rates of productivity on saved time.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of more than \$1,633,000.



BI Narrative Efficiency					
Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Number of analysts using BI	Composite	30	40	50
C2	Annual analyst hours spent on manual narrative creation and presentation before Arria	Interview	520	520	520
C3	Percentage of time saved with Arria	Interview	60%	60%	60%
C4	Analyst fully burdened hourly salary	TEI standard	\$45	\$45	\$45
C5	Percentage of time recaptured	Forrester research	50%	50%	50%
C6	Analyst savings	$C1 * C2 * C3 * C4 * C5$	\$210,600	\$280,800	\$351,000
C7	Number of decision-makers using BI	Composite	300	400	500
C8	Decision-maker hours spent on analysis per reporting period	Interview	8	8	8
C9	Reporting periods per year	Interview	12	12	12
C10	Percentage of time saved with Arria	Interview	30%	30%	30%
C11	Decision-maker fully burdened hourly salary	TEI standard	\$80	\$80	\$80
C12	Decision-maker savings	$C7 * C8 * C9 * C10 * C11 * C5$	\$345,600	\$460,800	\$576,000
Ct	BI narrative efficiency	$C6 + C12$	\$556,200	\$741,600	\$927,000
	Risk adjustment	↓10%			
Ctr	BI narrative efficiency (risk-adjusted)		\$500,580	\$667,440	\$834,300
Three-year total: \$2,002,320			Three-year present value: \$1,633,498		

DECREASED ERRORS AND REWORK

Evidence and data. Human-written narratives, especially those based on data, are prone to errors and data quality issues. While some mistakes may go unnoticed or require very little time to correct, others can be disastrous for an organization. This is particularly true if the mistake distorts key information for decision-makers or clients, leading to huge amounts of rework and mitigation. Narratives

generated by Arria NLG, in contrast, don't face any risk of human error.



Error reduction:

100%

- The decision-makers said their organization realized time savings by eliminating the time spent finding and correcting errors before reports and BI narratives were delivered to end users. A senior manager in professional services explained: “Along the way, we would waste a lot of hours because one cell can drive a lot of mistakes. So [inaccuracy] was an issue and it's definitely decreased since using Arria.”
- When errors made it into final deliverables, organizations faced timely rework, with someone potentially taking multiple days to correct one error. With Arria, turnaround time was reliably faster with the removal of this rework. An executive director in financial services described the benefits: “[Before Arria], it was turnaround time and overall time spent, and [then] somebody needed to really double-check it. Now we don't have to do that anymore.”

“Using Arria, it's the same calculation that's automatically done every time. You don't have to worry — you know this stuff is right.”
Executive director, financial services

- Another interviewee noted that Arria's narratives enabled them to find data quality issues and inconsistencies around naming that otherwise went unnoticed. With manual reporting, numbers could be misrepresented, but Arria's narrative generation removes that bias and ensures leaders receive all the facts.

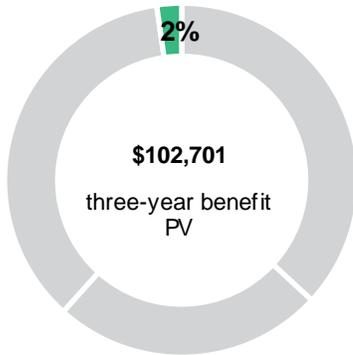
Modeling and assumptions. For the composite organization, Forrester assumes the following:

- Each decision-maker both receives a BI insight narrative and must share an update on their area of the business per report period, for a total of 7,200 BI narratives replaced by Arria in Year 1, 9,600 in Year 2, and 12,000 in Year 3.
- Four percent of the narratives replaced with Arria across reporting and insights generation contained at least one error. This is reduced to zero percent with Arria-generated narratives.
- Each report containing at least one error requires 5 hours of time on average for analysts to find the mistake, correct it, and deal with any consequences of the change.
- Each BI narrative containing at least one error requires 1.5 hours of analysts' and decision-makers' time each on average to find and correct errors and deal with consequences of the change.
- The fully burdened cost of a BI analyst is \$45 per hour, and the fully burdened cost of a decision-maker is \$80 per hour.
- Each FTE recaptures 50% of their saved time into productivity value.

Risks. The expected financial impact of reduced errors and rework is subject to risks and variation based on several factors, including:

- The quantity of narratives replaced by Arria.
- The error rate, level of QA review, and time spent resolving and correcting errors before Arria.
- Narrative use cases and associated quality risk.
- Compensation amounts for employees and recapture rates of productivity on saved time.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of about \$103,000.



Reduced Errors And Rework					
Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Number of reports automated by Arria NLG	B1	1,200	2,400	3,600
D2	Number of BI narratives automated by Arria NLG	C7*C9*2	7,200	9,600	12,000
D3	Percentage of narratives with errors before Arria	Interview	4%	4%	4%
D4	Hours of rework per error on average (reports)	Interview	5.0	5.0	5.0
D5	Analyst fully burdened hourly salary	TEI standard	\$45	\$45	\$45
D6	Decision-maker fully burdened hourly salary	TEI standard	\$80	\$80	\$80
D7	Hours of rework per error on average (BI narratives)	Interview	1.5	1.5	1.5
D8	Percentage of time recaptured	Forrester	50%	50%	50%
D9	Avoided labor cost for report errors	$D1 * D3 * D4 * D5 * D8$	\$5,400	\$10,800	\$16,200
D10	Avoided labor cost for dashboard errors	$D2 * D3 * (D5 + D6) * D7 * D8$	\$27,000	\$36,000	\$45,000
Dt	Reduced errors and rework	$D9 + D10$	\$32,400	\$46,800	\$61,200
	Risk adjustment	↓10%			
Dtr	Reduced errors and rework (risk-adjusted)		\$29,160	\$42,120	\$55,080
Three-year total: \$126,360			Three-year present value: \$102,701		

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- **Avoided hiring costs and expert labor costs, especially when scaling work.** When scaling up reporting or insight narrative capabilities, organizations that would traditionally have needed to hire additional employees to conduct the additional work avoided this cost with Arria. One interviewee noted that their organization could now shift work from diligence professionals to employees with less training, whose time was less expensive for the organization.
- **Improved employee experience.** Arria NLG improved the employee experience at the interviewee's organizations by releasing employees from highly manual work and through the cool factor of NLG technology. A project manager at a pharmaceutical organization stated: "People really like it. It gets people excited. They say it's really cool and interesting. And that feeds into like people's motivation and purpose." Another interviewee told Forrester, "Having to get through data is not something they want to do, and you let them get to the part of the job they enjoy."
- **A forward-thinking, innovative brand culture and brand image.** Multiple interviewees noted that their organizations invested in NLG as part of a deliberate innovation strategy to help bring employees further into the digital world. Implementation of NLG technology in one area of the business increased exposure to the technology across other areas of the business and led to faster adoption of new technologies across wider business units. Additionally, new standards of insight quality and consistency encouraged trust in decentralized decision-making.
- **Excellent customer service with access to NLG expertise.** Arria is the professional home to

the largest concentration of NLG expertise in the world, and interviewees frequently mentioned the help and guidance Arria provided their organizations during the implementation process. A project manager in the pharmaceutical industry stated: "The reason that we chose Arria over [a competitor] is because of their customer service. They were always really helpful and remained that way. They answered all our questions, were very accommodating, and helped us technically, writing things for us. They just stood head and shoulders above the others in terms of their communication and the way that they worked."

"It's a ridiculous time savings because no one can even do this. It's so far ahead of our time. it's completely groundbreaking."
Managing director, financial services

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement Arria NLG and later realize additional uses and business opportunities, including:

- **Expanded Arria deployment leading to synergies between use cases.** Arria offers products and services beyond the scope utilized by the composite organization. These include non-NLG services like NLP and NLU, as well as products like the conversational AI platform Arria Answers, or Arria Ping, an AI application developed especially for quick serve restaurants that provides managers with real-time alerts on performance and efficiency. Tools like these can be especially powerful when implemented with Arria's NLG capabilities.

- **Partnering with Arria.** Arria aligns with business partners to bring NLG into their own solutions and platforms, and these partnerships often grow out of existing customer relationships. Some interviewees' organizations entered a business partnership with Arria to customize their offerings and sell Arria's product with their own, leading to significant growth.
- **Opportunities to design custom use cases and build new products.** Arria uses its technology to build industry-specific products. Nearly all interviewees spoke to their organization's plans for future cases with Arria NLG, most of which would be custom-built for their organization, and which could turn into new products in their industry entirely. An executive director at a financial services company said, "I have probably a dozen ideas like that of where we can use it and grow it within a particular area."

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in [Appendix A](#)).

It's nowhere near its full potential both in terms of the market but also in [our organization]. I fully expect us to keep moving forward with it.

— Senior manager, professional services

Analysis Of Costs

■ Quantified cost data as applied to the composite

Total Costs							
Ref.	Cost	Initial	Year 1	Year 2	Year 3	Total	Present Value
Etr	Arria licensing and consumption	\$5,250	\$49,470	\$69,460	\$89,292	\$213,471	\$174,713
Ftr	Cloud hosting	\$0	\$75,600	\$88,200	\$100,800	\$264,600	\$217,352
Gtr	Implementation and maintenance	\$386,014	\$258,750	\$258,750	\$258,750	\$1,162,264	\$1,029,487
Htr	Training labor	\$5,460	\$24,570	\$11,340	\$11,340	\$52,710	\$45,688
	Total costs (risk-adjusted)	\$396,724	\$408,390	\$427,750	\$460,182	\$1,693,045	\$1,467,240

ARRIA LICENSING AND CONSUMPTION

Evidence and data. Arria licenses its products on a subscription model, with varying pricing options depending on its customers’ use cases. Arria Studio Creators, which create and edit Arria Studio projects, are priced at a flat fee of \$2,388 per user. Viewer seats are also priced per user starting at \$15 and decreasing as viewer numbers increase. Arria offers application-specific pricing when there is not a known identifiable user count, which is determined on a case-by-case basis. Advisory and training services for Arria use including Arria Apps, Arria Answers, and custom training is a highly recommended addition to the initial licensing fee at a cost of \$5,000.

Modeling and assumptions. This cost was modeled based on the following:

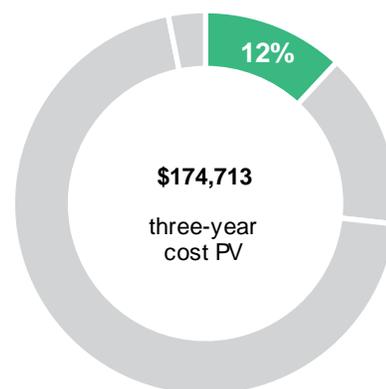
- The number of Arria Studio creators and viewers increase from three and 300 respectively to five and 500 from Year 1 to Year 3 as the organization scales Arria to the entire business unit.
- Application-specific pricing also increases each year as the scope of reporting automation and written insights within the business unit increases.

- The advisory and training services cost is realized during the initial implementation period before Year 1.

Risks. Actual licensing costs will vary per organization depending on a range of factors, including:

- Number of Arria Studio Creator and Viewer seats across the organization.
- Desired scope and complexity of custom applications.

Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of almost \$175,000.



Arria Licensing And Consumption

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
E1	Cost per developer license	List pricing		\$2,388	\$2,388	\$2,388
E2	Number of developer licenses	Composite		3	4	5
E3	Cost per end BI user (up to 500)	List pricing		\$15	\$15	\$15
E4	Cost per end BI user (500-1500)	List pricing		\$12	\$12	\$12
E5	Number of end BI users	C1+C7		330	440	550
E6	Application pricing	List pricing		\$35,000	\$50,000	\$65,000
E7	Arria Apps and custom training	List pricing	\$5,000	\$0	\$0	\$0
Et	Arria licensing and consumption	$E1 * E2 + E3 * 500 + E4 * 50 + E5 + E6$	\$5,000	\$47,114	\$66,152	\$85,040
	Risk adjustment	↑5%				
Etr	Arria licensing and consumption (risk-adjusted)		\$5,250	\$49,470	\$69,460	\$89,292
Three-year total: \$213,471			Three-year present value: \$174,713			

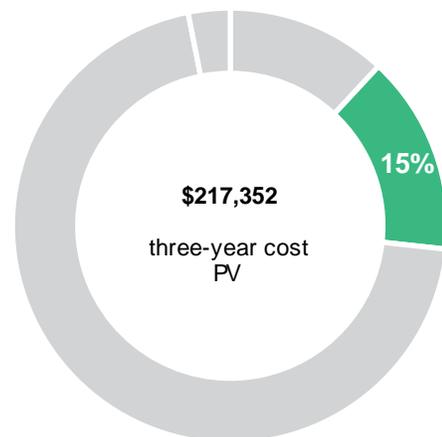
CLOUD HOSTING

Evidence and data. The composite organization pays Arria an annual fee for cloud hosting, as they chose to deploy Arria Studio with a private cloud hosted by Arria.

Modeling and assumptions. The annual cloud hosting fee increases as the organization’s reporting and BI narrative automation increases in scope and requires the processing of greater quantities of data.

Risks. Actual cloud hosting costs will vary per organization depending on the organization’s scope of Arria deployment and implementation and data complexity.

Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV of about \$217,000.



Cloud Hosting							
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3	
F1	Annual hosting cost for Arria private cloud	Composite		\$72,000	\$84,000	\$96,000	
Ft	Cloud hosting	F1	\$0	\$72,000	\$84,000	\$96,000	
	Risk adjustment	↑5%					
Ftr	Cloud hosting (risk-adjusted)		\$0	\$75,600	\$88,200	\$100,800	
Three-year total: \$264,600				Three-year present value: \$217,352			

IMPLEMENTATION AND MAINTENANCE

Evidence and data. The organizations incurred internal costs in the following categories related to their Arria investment:

- Internal implementation labor.** Both business and technical resources participated in the implementation of Arria. Implementation efforts included planning, coordinating among cross-organizational teams such as cloud or security teams, and integrating with other tools. Most organizations completed a POC test either on-site or in a sandbox environment before fully integrating Arria for use. One interviewee noted that they were able to parallel path the POC work and the statement of work, budgeting, and approval processes.
- While implementation times varied, it took about five months on average for the interviewee's organizations to fully implement Arria's solution from scoping conversations to first narrative creation with their intended use case.
- The organizations that implemented the quickest began with a simple use case and relied on preconfigured templates with few customizations and integrations.
- Implementation team size varied from two FTE to 15 to 20 people touching the engagement. One organization used a third-party delivery partner for implementation and optimization. Another paid Arria to develop their solution before moving the management in-house. Most met regularly with Arria throughout the implementation process.
- A managing director at a financial services organization shared: "The guy that picks up the Arria API first got a prototype working inside three days from start. It is incredibly impressive. Then, a junior team member in India was tasked with cutting her hand on this technology. She came from an electrical engineering background and had [only] nine months of any kind of work practice at all. She took just under two and a half weeks to code into Arria and decode it into Angular JavaScript. So, the eureka moment for us was very much that this API is so easy to use."
- Ongoing management, maintenance, and optimization.** Once in place, the Arria-created narratives required very little labor to maintain. One interviewee estimated that maintenance of Arria required about one day of work every two months. Every two or three years, larger data

changes or restructuring would require more significant effort.

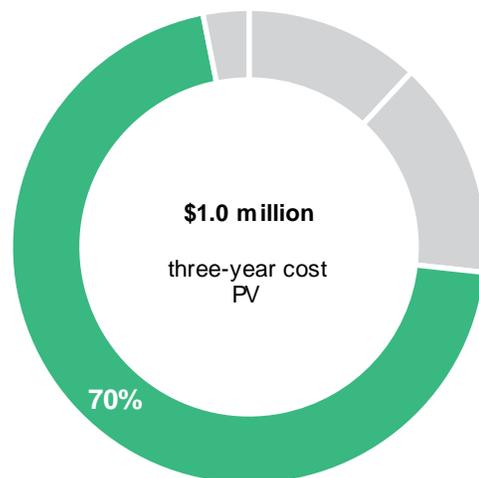
- However, most organizations spent ongoing labor to expand the reach of Arria NLG by expanding to additional types of narratives or data or new data sources. One interviewee estimated that it takes about 15 hours, or two workdays, to create a new template for a new kind of report. Another noted that leaders in their organization participated in biweekly calls to discuss opportunities, optimization, and the Arria development pipeline.

- The fully burdened annual salary of a developer is \$135,000.
- The fully burdened annual salary of a project manager is \$150,000.
- The fully burdened salary of an analyst is \$94,000 annually.
- The fully burdened salary of an administrator is \$80,000 annually.

Risks. Actual implementation and management costs will vary per organization depending on the following:

- An organization’s scope of Arria deployment and implementation complexity.
- An organization’s breadth and complexity of data sources.
- An organization’s choice of deployment and hosting.
- The maturity and fragmentation of an organization’s existing architecture.
- Hourly burdened cost for each employee involved with implementation and ongoing maintenance and administration.

Results. To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year, risk-adjusted total PV of about \$1,029,000.



Initial implementation cost:

\$386,000



Modeling and assumptions. This cost to the composite organization was modeled based on the following information:

- Implementation took the composite organization five months, or 0.42 years.
- Four developer FTEs completed the development work required for implementation. They were supported by one project manager FTE, one analyst FTE, and one administrative FTE spending 80% of their time on Arria.
- In Year 1 to Year 3, one developer FTE spent 80% of their time annually maintaining and expanding Arria’s work within the organization, supported by one analyst FTE.
- A project manager FTE and one administrative FTE each spent 10% of their time on ongoing Arria oversight in Year 1 to Year 3.

Implementation And Maintenance

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
G1	Length of time (years)	Composite	0.42	1.00	1.00	1.00
G2	Developer FTEs	Composite	4.00	0.80	0.80	0.80
G3	Developer fully burdened annual salary	TEI standard	\$135,000	\$135,000	\$135,000	\$135,000
G4	Project manager FTEs	Composite	0.80	0.10	0.10	0.10
G5	Project manager fully burdened salary	TEI standard	\$150,000	\$150,000	\$150,000	\$150,000
G6	Analyst FTEs	Composite	0.80	1.0	1.0	1.0
G7	Analyst fully burdened salary	TEI standard	\$94,000	\$94,000	\$94,000	\$94,000
G8	Administrator FTEs	Composite	0.80	0.10	0.10	0.10
G9	Administrator fully burdened salary	TEI standard	\$80,000	\$80,000	\$80,000	\$80,000
Gt	Implementation and maintenance	$G1*(G2*G3+G4*G5+G6*G7+G8*G9)$	\$335,664	\$225,000	\$225,000	\$225,000
	Risk adjustment	↑15%				
Gtr	Implementation and maintenance (risk-adjusted)		\$386,014	\$258,750	\$258,750	\$258,750
Three-year total: \$1,162,264			Three-year present value: \$1,029,487			

TRAINING LABOR

Evidence and data. While the composite organization pays Arria for the training Arria provides, they also face the labor costs associated with the time their employees spend receiving training. Training efforts for developers ranged between negligible time to a few months. For users working to automate reporting, training took about 4 to 8 hours. Decision-makers who received BI narratives did not require training.

Modeling and assumptions. To reflect the interviewees' experiences, Forrester assumes the following about the composite organization:

- Five developers each receive 16 hours of training during the implementation period, before Year 1.
- The burdened hourly cost of these developer resources is \$65.
- The 30 report analysts and 30 BI analysts using Arria in Year 1 each receive 8 hours of training, with an additional five equivalent training seats for developers, managers, or others. The burdened hourly cost of these resources is \$45.
- In Year 2 and Year 3, the additional analysts Arria supports each receive 8 hours of training, along with an additional ten equivalent training

User training time:

4-8 hours

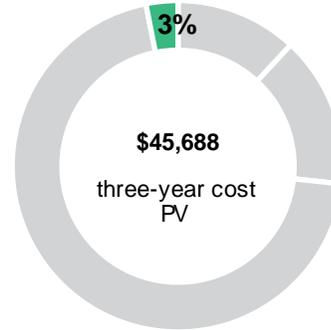


seats across the business unit to account for turnover and any additional training required.

Risks. Actual training labor costs will vary per organization depending on the following:

- The knowledge and skillsets of existing technical and business user resources.
- The training method and delivery mechanism.
- The scope of engagement with Arria and number of employees involved.
- The hourly burdened salary for each employee involved in training.

Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV of almost \$46,000.

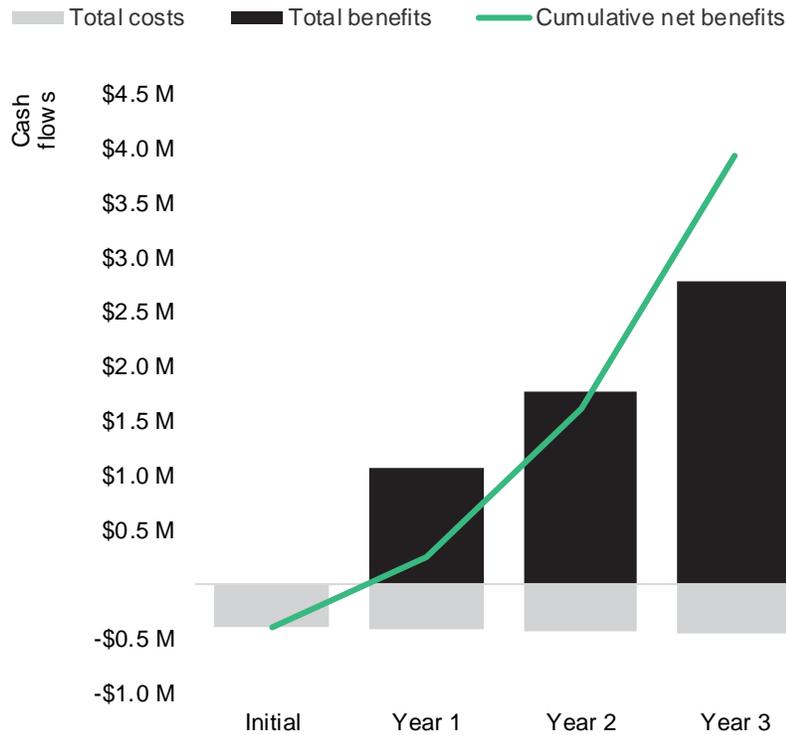


Training Labor						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
H1	Number of people trained	Composite	5	65	30	30
H2	Hours of training/person	Composite	16	8	8	8
H3	Average hourly salary	TEI standard	\$65	\$45	\$45	\$45
Ht	Training labor	H1 * H2 * H3	\$5,200	\$23,400	\$10,800	\$10,800
	Risk adjustment	↑5%				
Htr	Training labor (risk-adjusted)		\$5,460	\$24,570	\$11,340	\$11,340
Three-year total: \$52,710			Three-year present value: \$45,688			

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$396,724)	(\$408,390)	(\$427,750)	(\$460,182)	(\$1,693,045)	(\$1,467,240)
Total benefits	\$0	\$1,063,020	\$1,776,120	\$2,789,220	\$5,628,360	\$4,529,832
Net benefits	(\$396,724)	\$654,630	\$1,348,370	\$2,329,038	\$3,935,315	\$3,062,592
ROI						209%
Payback						8 months

Appendix A: Total Economic Impact

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

TOTAL ECONOMIC IMPACT APPROACH

Benefits represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.

Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.



PRESENT VALUE (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.



NET PRESENT VALUE (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.



RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.



DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.



PAYBACK PERIOD

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Appendix B: Supplemental Material

Related Forrester Research

“New Tech: Natural Language Generation (NLG) Technologies, Q3 2018,” Forrester Research, Inc., September 24, 2018.

“Enable An Insights-Driven Business,” Forrester Research, Inc., April 29, 2021.

“Dare To Disrupt With Technology-Driven Innovation,” Forrester Research, Inc., July 19, 2019.

“Best Practices For Technology-Driven Innovation,” Forrester Research, Inc., August 2, 2021.

“Predictions 2022: Automation,” Forrester Research, Inc., October 28, 2021.

“The Forrester Wave™: Augmented BI Platforms, Q3 2021,” Forrester Research, Inc., August 16, 2021.

“New Tech: Natural Language Generation (NLG) Technologies, Q3 2018,” Forrester Research, Inc., September 24, 2018.

“Augmented BI Holds New Promises, But It’s Still Early Days,” Forrester Research, Inc., November 9, 2021.

Appendix C: Endnotes

¹ Source: “Best Practices For Technology-Driven Innovation,” Forrester Research, Inc., August 2, 2021.

² Source: “Predictions 2022: Automation,” Forrester Research, Inc., October 28, 2021.

³ Source: “Augmented BI Holds New Promises, But It’s Still Early Days,” Forrester Research, Inc., November 9, 2021.

⁴ Source: “New Tech: Natural Language Generation (NLG) Technologies, Q3 2018,” Forrester Research, Inc., September 24, 2018.

⁵ Total Economic Impact is a methodology developed by Forrester Research that enhances a company’s technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

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